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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/760,398

01/21/2004

Tigran Galstian

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04/04/2005

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EXAMINER

CONNELLY CUSHWA, MICHELLE R

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/760,398	Applicant(s) GALSTIAN ET AL.	
	Examiner Michelle R. Connelly-Cushwa	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-14, 16 and 17 is/are rejected.
- 7) ☒ Claim(s) 9, 10 and 15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0104</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Priority

Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) or 120 as follows:

An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence(s) of the specification or in an application data sheet by identifying the prior application by application number (37 CFR 1.78(a)(2) and (a)(5)). If the prior application is a non-provisional application, the specific reference must also include the relationship (i.e., continuation, divisional, or continuation-in-part) between the applications except when the reference is to a prior application of a CPA assigned the same application number.

Applicant has indicated that the present application is a continuation of U.S. Application No. 10/658,462, which claims priority from 60/409,197, on page 3 of the Application Data Sheet filed January 21, 2004. A preliminary amendment was filed on January 21, 2004 and a sentence was added to the present application to indicate that the present application is a continuation of U.S. Application No. 10/658,258, which claims priority to 60/490,233. Application should further amend the present specification to add an additional reference to U.S. Application No. 10/658,462 in addition to 10/658,258.

Information Disclosure Statement

The prior art documents submitted by applicant in the Information Disclosure Statement filed on January 21, 2004 have all been considered and made of record (note the attached copy of form PTO-1449).

Drawings

Eight (8) sheets of formal drawings were filed on January 21, 2004 and have been accepted by the Examiner.

Specification

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

Claims 2 and 15 are objected to because of the following informalities:

Regarding claim 2; "wavelguide" in lines 5 and 7 of claim 2 should be changed to --waveguide--.

Regarding claim 15; the claim should end with a period (.).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8, 11-14 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Yao (US 6,628,850 B1).

Regarding claim 1; Yao discloses a variable optical device (100) for selectively controlling propagation of light (101) within an optical waveguide (110) in Figures 1, 1A and 1B, the optical device (100) comprising:

- a relief modulation (120, see column 2, lines 50-53) defining a grating (120) disposed proximal the waveguide (110) and having a respective grating index of refraction;
- a matrix (dielectric material, see column 2, lines 58-65) surrounding at least the relief modulation, the matrix having an index of refraction that is controllable, in response to a selected stimulus between a first value that is substantially equal to the grating index of refraction and a second value (see column 2, line 66, through column 3, line 5); and
- at least one electrode (130 includes electrodes, see column 3, lines 19-29) for supplying the selected stimulus to the matrix.

Regarding claim 2; the relief modulation is disposed relative to the waveguide so as to interact with any one or more of:

- core modes of light propagating within the waveguide (see column 2, lines 29-41);
- an evanescent field of light propagating within the waveguide (see column 2, lines 19-22); and
- cladding modes of light propagating within the waveguide (see column 2, lines 29-41).

Regarding claim 3; the relief modulation may comprise chirped relief modulations (see column 2, lines 24-28).

Regarding claim 4; the relief modulation is formed in a cladding layer (114) of the optical waveguide (110).

Regarding claim 5; the relief modulation may be formed in a substrate (214) that is positioned proximal a planar waveguide (210), as shown in Figure 2 of Yao.

Regarding claim 6; the grating index of refraction is substantially fixed when a first value of a control signal is applied.

Regarding claim 7; the grating index of refraction is substantially equal to a cladding index of refraction of a cladding layer of the waveguide, when it has a first value (see column 2, line 67, through column 3, line 1).

Regarding claim 8; the grating index of refraction is variable in response to a predetermined stimulus (the grating index of refraction varies when the value of the control signal is changed).

Regarding claim 11; Yao discloses that a plurality of electrodes are incorporated in the system for generating an arbitrary electric field in the vicinity of the grating, the plurality of electrodes being an array of electrodes (see column 3, lines 20-25).

Regarding claim 12; the electrodes are positioned out of contact with an evanescent field of light propagating in the waveguide core in the invention of Yao.

Regarding claim 13; Yao discloses that the device may further comprise two or more relief modulations defining respective gratings, each grating being associated with at least one respective electrode (see Figure 1A; column 2, lines 15-18; and column 3, lines 43-52).

Regarding claim 14; at least one grating may be oriented relative to the waveguide differently from at least one other grating (see Figure 1A and column 2, lines 15-18).

Regarding claim 16; the relief modulation may be oriented at an angle relative to a core of the waveguide, such that light reflected by the relief modulation is at least partially out-coupled from the core (light may be out-coupled from a core mode to a cladding mode; see column 2, lines 35-41).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yao (US 6,628,850 B1).

Regarding claim 17; Yao discloses all of the limitations of claim 17 as applied above, except for the device further comprising a photodetector disposed to receive at least a portion of the out-coupled light. Grating assisted couplers are commonly used to direct light out of optical waveguides to photodetectors for various applications, including monitoring and/or analyzing the light. One of ordinary skill in the art would have found it obvious to use the grating coupler disclosed by Yao to direct light to a photodetector from the waveguide in order to monitor and/or analyze the light, since grating couplers are commonly used for this, and since Yao teaches that the optical device of the present invention may be used to transport light from one location to another in an optical network, within an integrated optical device, or in other settings, thereby suggesting that the grating coupler can be used in any desired optical network or integrated device that employs grating couplers.

Allowable Subject Matter

Claims 9, 10 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 9 and 10; the claims are allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical device as defined in claim 9, wherein a sign change of the grating

refractive index in response to the stimulus is opposite the sign of change of the matrix refractive index in response to the stimulus. Claim 10 depends from claim 9.

Regarding claim 15; the claims are allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical device as defined in claim 15, further comprising a first mode converter disposed upstream of the relief modulation for converting core modes into cladding modes, and a second mode converter disposed downstream of the relief modulation for converting cladding modes into core modes.

Hence, there is no reason or motivation for one of ordinary skill in the art to use the prior art of record to make the invention of claims 9, 10 and 15.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Jordan et al. (US 6,522,795 B1) discloses a tunable etched grating for WDM optical communication systems in which a relief grating modulation is filled with a matrix that has a variable index of refraction in response to an applied control signal (see the abstract, figures and disclosure).

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

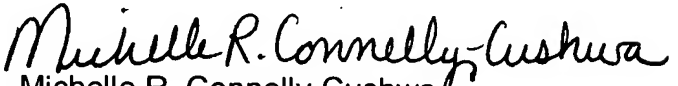
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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.


Michelle R. Connelly-Cushwa
Patent Examiner
March 30, 2005